The Impact of a Ketogenic Diet vs the Mediterranean Diet on Cardiovascular Disease Risk Factors of Obese Adults

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Abstract

The Mediterranean diet (MD) is a well-established and highly-studied diet that has been recommended by the medical field for decades; however, with the current obesity epidemic intensifying each year, it is imperative that other options are brought forth for those who might require a more intense initial regimen, or for those who may not be able to process the high carbohydrate load in MDs.

Ketogenic diets (KD) have been shown to be highly effective in causing significant weight loss and have also shown promising results in the reduction of cardiovascular disease (CVD) risk factors. This study will explore the improvement of CVD risk factors of obese adults on a KD compared to a MD.

Introduction

As of 2018, the Centers for Disease Control and Prevention found that just over 42% of US citizens are estimated to be obese (BMI > 30.0.) This has consequences, as in 2017 alone, 4.7 million people died worldwide due to conditions that are strongly linked to obesity, such as heart disease, stroke, diabetes, and various cancers.

The MD is one well-studied option to reduce and maintain a healthy weight and improve cardiovascular profiles. This diet encourages the consumption of fruits, vegetables, whole grains, healthy fats, fish, poultry, legumes, and eggs, while limiting red meat consumption. Many clinicians believe that this is a good option for most individuals to follow; however, the high carbohydrate content may be unfavorable for patients with metabolic syndrome or CVD.

KDs may be another beneficial option for those looking to lose weight. They encourage approximately 70% of calories come from fat, with the remainder from protein with <50g daily of carbohydrates. If done correctly, this regimen triggers the body to enter a state of catabolism, breaking down body fat into ketones via ketogenesis while sparing muscle. Initial studies have indicated that KDs rapidly improve CVD risk factors, which could play a huge role in mitigating the morbidity of obesity if applied on a population level.

Methods

Several literature searches were conducted through PubMed in November 2019 and another through Academic Search Premier in July 2020. Six articles were selected that involved KDs, including randomized control trials, a prospective cohort study, and observational clinical trials. A final article was chosen for its in-depth analysis of MDs. The articles were selected by publication date, cohort population, and relevance.

Results

All six KD studies demonstrated a statistically significant decrease in body weight, ranging from approximately 10 to 20 kg on average. This is significantly more than participants in MD trials from the systematic review, with total weight loss decreasing approximately 1 kg.

There was also a significant decrease in systolic blood pressure (SBP) in the four KD studies that analyzed it, ranging from a 7 mmHg to 16.7 mmHg average decrease. In the MD trials, SBP decreased an average of 3 mmHg.

There were also statistically significant improvements in visceral adipose, lipid profile, and blood glucose among the various KD protocols; however, several parameters of quality were inadequate.

Table 3. Summary of Results

Study	Body Weight	Visceral Fat	Systolic BP	Lipid Profile	Blood glucose
Choi HR, Kim J, Lim H, et al.	S	-	-	S	-
Gomez-Arbelaez D, Bellido D, Castro A, et al.	S	S	-	-	-
Pérez-Guisado J, Muñoz-Serrano A, Alonso-Moraga A.	S	-	S	S	S
Castaldo G, Monaco L, Castaldo L, et al.	S	S	S	S	S
Cicero, A. F., Benelli, M., Brancaleoni, M., et al.	S	-	S	S	S
Moreno, B., Crujeiras, A.B., Bellido, D. et al.	S	S	-	-	-
Sánchez-Sánchez ML, García-Vigara A, et al.	NS	-	NS	S	S

Key: S = Statistically significant; NS = Not statistically significant; - = Results not available; P ≤ 0.05

BW S = BW decrease of 7+ kg NS = Decrease <7 kg	VF S = VF change NS = No VF change	SBP S = SBP decrease 5+ mmHg NS = SBP decrease <5 mmHg	BLP S = reduction in LDL-C and TG with increase in HDL-C NS = no/minor reduction in LDL-C and TG, or a decrease in HDL-C	BG S = avg BG decreased 10+ mg/dL NS = avg BG decreased <10 mg/dL

Discussion

While the data from the six KD studies demonstrated more impressive reductions in body weight and CVD risk factors than the MD trials, there are many problems with the KD studies.

Compared to the MD trials, which had high statistical power due to their large randomized trials that took place over the span of years, there were many weaknesses in the KD experiments, including inferior study designs, few participants, short study duration, and varied procedures among KDs.

Conclusion

For decades, the MD has been the recommendation of choice for weight maintenance and CVD risk reduction and should remain so for the foreseeable future.

While patients may potentially benefit from a more intensive weight loss regimen like the KD, the current data is too weak to recommend it over the MD. Despite its flaws, the preliminary data collected involving reduction in CVD risk factors are encouraging and may inspire more wide-spread, rigorous protocols involving the KD in the future.

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